(12) UK Patent Application (19) GB (11) 2 194 302 (13) A

(43) Application published 2 Mar 1988

(21) Application No 8617218

(22) Date of filing 15 Jul 1986

(51) INT CL⁴
F16L 41/02

(52) Domestic classification (Edition J):
F2G 1 1H 28
U1S 1884 2318 F2G

(56) Documents cited
None

(58) Field of search
F2G
F2B
Selected US specifications from IPC sub-classes F16L
F16J

(71) Applicant
R. M. Fabrications Limited

(Incorporated in United Kingdom)

2 Paddock Road, West Pimbo, Skelmersdale WN8 9PL

(72) Inventor
Peter Bond

(74) Agent and/or Address for Service
Marks & Clerk,
Suite 301, Sunlight House, Quay Street, Manchester
M3 3JY

# (54) Resilient pipe coupling

(57) A sealing device in the form of a resilient sleeve for sealing a gap defined between the end of an outer conduit and an inner conduit extending through the outer conduit. One end of the resilient sleeve is a tight fit over the end of the outer conduit and the other end of the resilient sleeve is a tight fit over the inner conduit. A sealable branch connector communicates with the interior of the sleeve, whereby the effectiveness of the seal formed between the inner and outer conduits can be tested by pressure testing the space defined between the inner and outer conduits through the branch connector and subsequently sealing the branch connector.

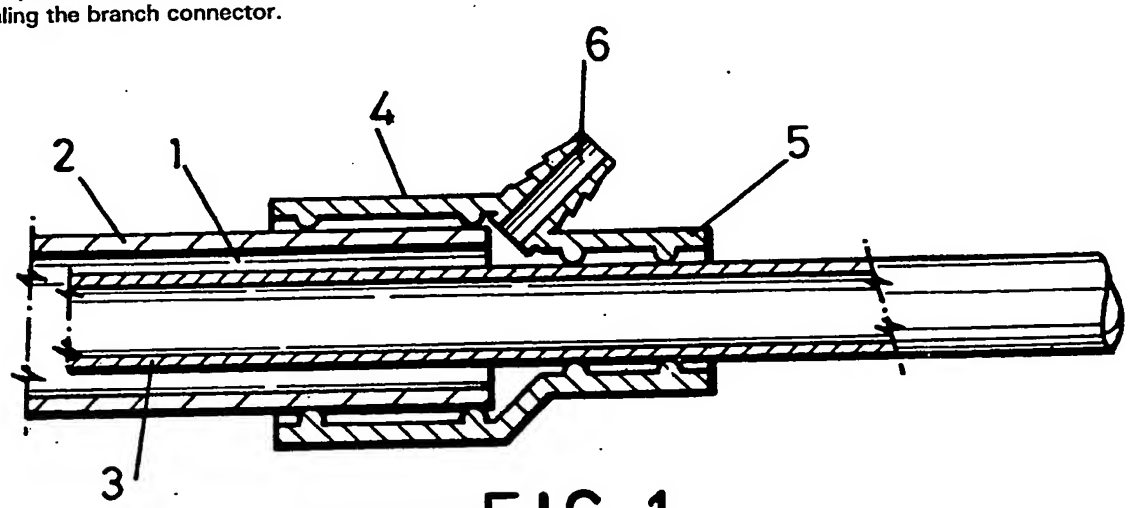


FIG. 1

GB 2 194 302 A

2194302

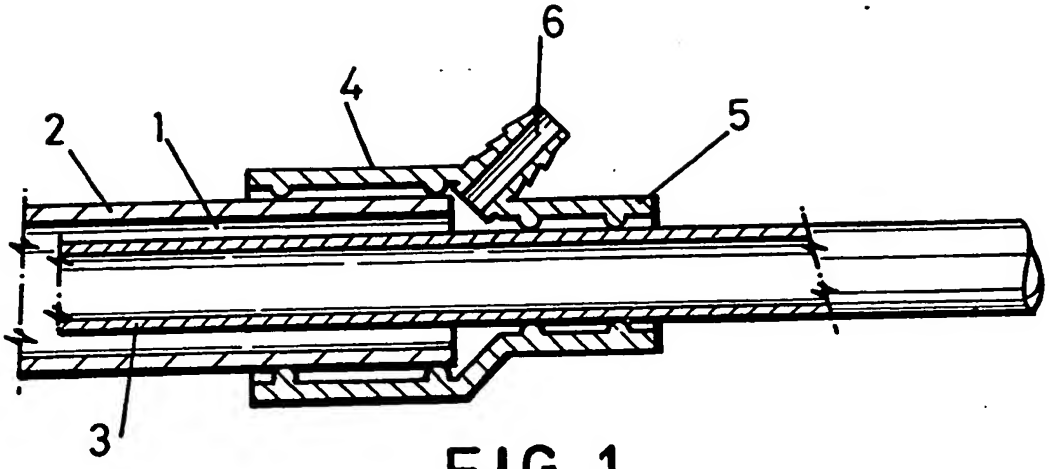


FIG. 1

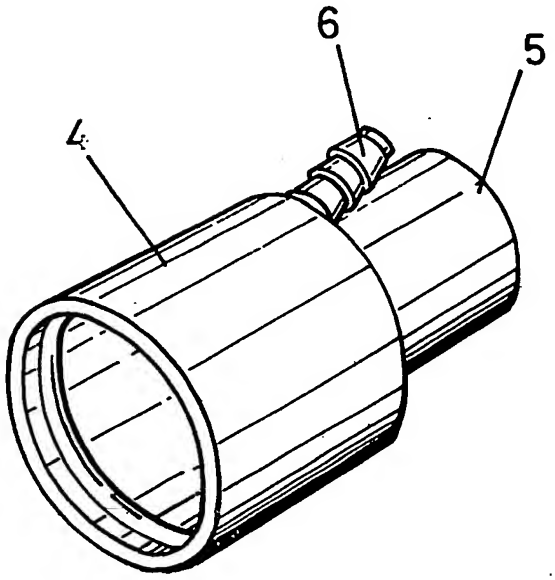


FIG. 2

SPECIFICATION

**Sealing device**

The present invention relates to a sealing device and in particular to a sealing device for sealing a gap defined between the end of an outer conduit and an inner conduit extending through the outer conduit.

When gas supply networks were initially installed gas was conveyed from a main conduit to a users premises through a branch conduit fabricated from iron piping. The installed iron piping has deteriorated over the years and is now being replaced by polyethylene piping.

The required internal diameter of polyethylene piping used to deliver natural gas can be considerably less than the internal diameter of the existing iron pipe which is to be replaced. Accordingly replacement polyethylene pipe can be threaded through the existing iron pipe thereby considerably reducing the excavation work necessary when piping is to be refurbished. Unfortunately a tubular space is defined between the outside of the polyethylene pipe and the inside of the iron pipe through which it is threaded. In the event of a gas leak occurring outside a users premises adjacent to the end of an iron pipe into which a replacement polyethylene pipe leads leaking gas can pass through the tubular space defined around the polyethylene pipe and into a users premises. Even relatively small gas leakages can result in the formation of dangerous explosive gas/air mixtures if the gas penetrates for example beneath the floor of a users premises. Accordingly it is necessary to seal the end of the pipe remote from the users premises into which the polyethylene pipe is threaded.

The annual gap defined between the outside of the polyethylene pipe and the end of the iron pipe can be sealed in a variety of ways. For example an appropriate grout can be inserted or a mechanical coupling can be secured on the end of the iron pipe with a compression fitting adapted to grip the outside of the polyethylene pipe. Such arrangements are however difficult to use reliably and generally require a considerable area of space around the end of the iron pipe to provide access for suitable tooling. Furthermore because of the potentially catastrophic consequences of an inadequate seal being formed between the end of the iron pipe and the polyethylene pipe it is usually considered necessary to pressure test the space defined betwen the two pipes so as to confirm that it has been adequately sealed. This again increases the complexity in terms of manufacturing cost and handling cost using conventional sealing methods.

It is an object of the present invention to obviate or mitigate the above problem.

According to the present invention there is provided a sealing device for sealing a gap defined between the end of an outer conduit and an inner conduit extending through the outer conduit, comprising a resilient sleeve one end of which is a tight fit over the end of the outer conduit and the other end of which is a tight fit over the inner conduit, and a sealable branch connector communicating with the interior of the sleeve, whereby the effectiveness of the seal formed between the inner and outer conduits can be tested by pressure testing the space defined between the inner and outer conduits through the branch sleeve and subsequently sealing the branch sleeve.

It is a relatively simple matter to reliably seal a branch sleeve as compared with reliably sealing an annular gap defined between the inner and outer conduits. A reliable seal between the sleeve and the inner and outer conduits can be achieved simply by manufacturing the sleeve from an appropriate material to appropriate dimensions. Accordingly the sealing device of the present invention can be easily used and provides the necessary reliability.

An embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

*Figure 1* is a sectional view through an embodiment of the present invention; and

*Figure 2* is a side view of a branch connector or nipple which is a component part of the sealing device of Fig. 1.

Referring to the accompanying drawings, the illustrated sealing device is intended to seal one end of the tubular space 1 defined between the inner surface of an outer conduit 2 formed by for example an iron gas pipe and the outer surface of an inner conduit 3 in the form of for example a polyethylene gas pipe which is threaded through the outer conduit 2.

The sealing device comprises a soft rubber sleeve having a larger end 4 and a smaller end 5. The larger end 4 is dimensioned to be a tight fit over the outer surface of the outer conduit 2 and the smaller end 5 is dimensioned to be a tight fit over the outer surface of the inner conduit 3. Thus when the outer end 4 is slipped over the end of the conduit 2 and the inner conduit 3 is pushed through the smaller end 5 an effective seal will be formed between the sleeve and the outer surfaces of the two conduits.

It may be that because of the surface conditions of the conduits or because of damage to the sleeve that the seal between the sleeve and the two conduits will not be perfect. For this reason it is essential to be able to pressure test the space 1. To this end a hard rubber nipple 6 (Fig. 2) is fitted into a circular hole defined in the portion of the sleeve linking the large end 4 to the small end 5. The nipple 6 defines a pair of flanges between which the wall of the sleeve is secured and appropriate sealants may be used to ensure reliable sealing of the joint between the nipple

6 and the sleeve.

In use the sleeve is positioned on the inner and outer conduits and a pressure testing device is connected to the nipple 6. Assuming that the sealing at both ends of the outer conduit 2 is effective there will be no leakage into or out of the space 1 and this will be confirmed by the pressure test. Pressure testing equipment of conventional type may be used. Once a successful pressure test has been conducted the pressure testing equipment can be disconnected from the nipple 6 and the nipple 6 can be easily sealed by sliding over it a resilient sealing cap (not shown) which will be engaged by the ridges on the nipple 6. Thus a very economic and easy to use device is provided which reliably seals the gap between the two conduits.

CLAIMS

1. A sealing device for sealing a gap defined between the end of an outer conduit and an inner conduit extending through the outer conduit, comprising a resilient sleeve one end of which is a tight fit over the end of the outer conduit and the other end of which is a tight fit over the inner conduit, and a sealable branch connector communicating with the interior of the sleeve, whereby the effectiveness of the seal formed between the inner and outer conduits can be tested by pressure testing the space defined between the inner and outer conduits through the branch connector and subsequently sealing the branch connector.

2. A sealing device according to claim 1, wherein the sleeve is fabricated from soft rubber and the branch connector is fabricated from hard rubber.

3. A sealing device according to claim 1 or 2, comprising a resilient sealing cap which is engageable over the branch connector.

4. A sealing device substantially as hereinbefore described with reference to the accompanying drawings.

Published 1988 at The Patent Office, State House, 66/71 High Holborn, London WC1R 4TP. Further copies may be obtained from The Patent Office, Sales Branch, St Mary Cray, Orpington, Kent BR5 3RD. Printed by Burgess & Son (Abingdon) Ltd. Con. 1/87.